WHAT IS CLAIMED IS:

1. An osteogenic osteoimplant in the form of a flexible sheet comprising a coherent mass of bone-derived particles, the coherent mass formed at least in part from elongate bone-derived elements optionally in combination with bone powder, the osteoimplant possessing an average void volume of not greater than about 32%.

2. The osteoimplant of Claim 1 having a thickness of between about 50 microns and about 2000 microns.

3. The osteoimplant of Claim 1 wherein the coherent mass has a bone element content of from about 5 to 100 weight percent based on the weight of the coherent mass calculated prior to compression of the coherent mass.

4. The osteoimplant of Claim 1 wherein the bone-derived particles are selected from the group consisting of nondemineralized bone particles, demineralized bone particles, and mixtures thereof.

5. The osteoimplant of Claim 1 wherein the bone particles are obtained from cortical, cancellous or cortico-cancellous bone of autogenous, allogenic, xenogenic or transgenic origin.

6. The osteoimplant of Claim 1 wherein the bone particles comprise a mixture of nondemineralized bone particles and demineralized bone particles.

7. The osteoimplant of Claim 1 wherein the ratio of elongate bone-derived elements to bone powder to is between about 1:0 to 1:9.

8. The osteoimplant of Claim 1 wherein the coherent mass is mechanically shaped to a specific three-dimensional architecture.

9. The osteoimplant of Claim 1 wherein the bone-derived particles are fully demineralized.

10. The osteoimplant of Claim 4 further comprising at least one bio-compatible component.

11. The osteoimplant of Claim 10 wherein the biocompatible component is selected from the group consisting of biocompatible fluid carrier, biocompatible binder, filler, fiber, mesh, substance providing radiopacity, plasticizer, biostatic/biocidal agent, surface active agent and bioactive substance.

12. The osteoimplant of Claim 1 further comprising at least one zone of impermeability to soft tissue ingrowth wherein said zone is integral with the osteoimplant.

13. The osteoimplant of Claim 1 configured and dimensioned in the shape of a sheet, plate, disk, tunnel, ring, cone, or tube.

14. A method of forming an osteogenic osteoimplant having not greater than about 32% void volume, the method comprising:

providing a coherent mass of bone particles optionally in combination with one or more biocompatible components, the coherent mass formed at least in part from elongate bone-derived elements optionally in combination with bone powder; and,

mechanically shaping the coherent mass of bone particles to form the osteogenic osteoimplant.

15. The method of Claim 14 wherein the bone particles are obtained from cortical, cancellous and corticocancellous bone of autogenous, allogenic, xenogenic and transgenic origin.

16. The method of Claim 14 wherein the biocompatible component is selected from the group consisting of biocompatible fluid carrier, biocompatible binder, filler, fiber, mesh, substance providing radiopacity, plasticizer, biostatic/biocidal agent, surface active agent, and bioactive substance.

17. The method of Claim 14 which further comprises applying heat to the composition before, during or after mechanically shaping the coherent mass.

18. The method of Claim 14 which further comprises cross-linking bone particles within the composition before, during or after mechanically shaping the coherent mass.

19. The method of Claim 14 which further comprises dehydrating the composition before, during or after mechanically shaping the coherent mass.

20. The method of Claim 17 which further comprises dehydrating the heated, mechanically shaped coherent mass after applying the heat.

21. The method of Claim 14 wherein the step of mechanically shaping comprises pressing, extruding and/or rolling.

22. The method of Claim 21 further comprising means for the application of lateral force.

23. The method of Claim 22 wherein a compressive and lateral force is applied simultaneously.

24. The method of Claim 14 further comprising the step of placing the coherent mass between two flexible stick-resistant surfaces prior to the step of mechanically shaping.

25. The method of Claim 14 further comprising the step of placing the coherent mass of bone-derived particles on an inflexible, impermeable, horizontally planar work surface prior to the step of mechanically shaping.

26. The method of Claim 25 wherein the step of mechanically shaping further comprises contacting the coherent mass with at least one revolving cylindrical roller.

27. The method of Claim 26 wherein at least one of the revolving cylindrical roller is modified to provide for the surface treatment of one or both surfaces of the osteoimplant.

28. The method of Claim 14 further comprising the step of:

occluding a portion of the surface area of the osteoimplant to provide at least one zone of impermeability to soft tissue ingrowth wherein said zone is integral with the osteoimplant.

29. The method of Claim 28 wherein the occluding step comprises heating a portion of the surface area at elevated temperature.

30. The method of Claim 28 wherein the occluding step comprises crosslinking bone particles at a portion of the surface area of the mechanically shaped mass.

31. The method of Claim 14 further comprising the step of shaping the osteoimplant to a determined form, configuration and/or three-dimensional architecture.

32. The method of Claim 14 further comprising the step of layering and fastening the osteoimplant to form a laminate material.

33. An osteoimplant comprising a mechanically shaped composition of elongate bone particles selected from the group consisting of nondemineralized bone particles, demineralized bone particles, and combinations thereof, wherein the osteoimplant possesses a void volume not greater than about 32%.

34. The osteoimplant of Claim 33 further comprising at least one biocompatible component.

35. The osteoimplant of Claim 33 wherein the biocompatible component is selected from the group consisting of biocompatible fluid carrier, biocompatible binder, filler, fiber, mesh, substance imparting radiopacity, surface active agent, bioactive substance and biostatic/biocidal agent.

36. An osteoimplant prepared by the method of claim 14.

37. An osteoimplant prepared by the method of claim 17.

38. An osteoimplant prepared by the method of claim 26.

39. An osteoimplant prepared by the method of claim 28.

40. An osteoimplant prepared by the method of claim 31.